WHAT IS CLAIMED IS:

1.   A method for simulating a flow field, the method comprising:

generating a grid comprising a plurality of cells, each cell associated with a set of variables for describing an unsteady flow field;

calculating a value for each variable of each cell from a previous value at each period for a predetermined number of periods by applying a flow field function to the previous value;

averaging the calculated values for each variable of each cell to yield an averaged value for each variable; and

determining the unsteady flow field from the averaged values.

2.   The method of Claim 1, wherein the grid describes a bay of an aircraft.

3.   The method of Claim 1, further comprising determining a transient period for the values.

4.   The method of Claim 1, wherein the flow field function comprises a Navier-Stokes function.

5.   The method of Claim 1, wherein:

each period comprises a plurality of steps; and

calculating the value for each variable of each cell comprises:

computing the value for each variable of each cell at each step; and

recording the value at a predetermined number of steps.

6.   The method of Claim 1, wherein the periods for the cells are substantially equivalent.

7.   The method of Claim 1, wherein a larger cell has a period less than a period for a smaller cell.

8.   The method of Claim 1, further comprising:

adjusting the averaged values to a survey grid; and

applying a simulation process to the adjusted values.

9.   The method of Claim 1, wherein the set of variables comprises at least one velocity variable, a pressure variable, and a temperature variable.

10.   The method of Claim 1, wherein the set of variables comprises at least one momentum variable, a density variable, and an energy variable.

11. A method for simulating a flow field, the
method comprising:

generating a grid comprising a plurality of cells,
each cell associated with a set of variables for
describing a flow field;

calculating a value for each variable of each cell
from a previous value at each period for a predetermined
number of periods by applying a Navier-Stokes function to
the previous value, wherein a larger cell has a period
less than a period for a smaller cell;

averaging the calculated values for each variable of
each cell to yield an averaged value for each variable;

adjusting the averaged values to a survey grid; and

applying a simulation process to the adjusted
values.

12. The method of Claim 11, wherein the grid
describes a bay of an aircraft.

13. The method of Claim 11, further comprising
determining a transient period for the values.

14. The method of Claim 11, wherein:

each period comprises a plurality of steps; and

calculating the value for each variable of each cell
comprises:

computing the value for each variable of each
cell at each step; and

recording the value at a predetermined number
of steps.

15. The method of Claim 11, wherein the set of variables comprises at least one velocity variable, a pressure variable, and a temperature variable.

16. The method of Claim 11, wherein the set of variables comprises at least one momentum variable, a density variable, and an energy variable.

17. A system for simulating a flow field, the system comprising:

    a grid generator generating a grid comprising a plurality of cells, each cell associated with a set of variables for describing a flow field;

    a flow field module coupled to the grid generator, the flow field module calculating a value for each variable of each cell from a previous value at each period for a predetermined number of periods; and

    an averaging module coupled to the flow field module, the averaging module averaging the calculated values for each variable to yield an averaged value for each variable.

18. The system of Claim 17 wherein the flow field module calculates a value for each variable by applying a flow field function to the previous value.

19. The system of Claim 18, wherein the flow field function comprises a Navier-Stokes function.

20. The system of Claim 17, wherein the periods for the cells are substantially equivalent.

21. The system of Claim 17, wherein a larger cell has a period less than a period for a smaller cell.

22.   The system of Claim 17, further comprising:

an interpolation module coupled to the averaging module, the interpolation module adjusting the averaged values to a survey grid; and

a simulation module coupled to the interpolation module, the simulation module applying a simulation process to the adjusted values.

23. A system for simulating a flow field, the system comprising:

a grid generator generating a grid comprising a plurality of cells, each cell associated with a set of
5   variables for describing a flow field;

a flow field module coupled to the grid generator, the flow field module calculating a value for each variable of each cell from a previous value at each period for a predetermined number of periods by applying
10   a Navier-Stokes function to the previous value, wherein a larger cell has a period less than a period for a smaller cell;

an averaging module coupled to the flow field module, the averaging module averaging the calculated
15   values for each variable to yield an averaged value for each variable;

an interpolation module coupled to the averaging module, the interpolation module adjusting the averaged values to a survey grid; and
20   a simulation module coupled to the interpolation module, the simulation module applying a simulation process to the adjusted values.